

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

Please amend claims 1, 8, 9, 14, 38, 39, 43 and 45, as follows:

1. (Currently amended) An optical apparatus including at least one barrel for accommodating optical elements, the optical apparatus comprising:
 - a chamber which accommodates said barrel;
 - a first purge mechanism provided with said barrel to supply a first gas into said barrel;
 - a second purge mechanism provided with said barrel to supply a second gas having a composition differing from the first gas into said barrel;
 - an operation condition detecting mechanism disposed in said chamber to detect the concentration of a predetermined gas inside said chamber; and
 - a control apparatus connected to said first purge mechanism, said second purge mechanism and said operation condition detecting mechanism ~~to selectively connect~~ such that said barrel ~~to~~ is selectively communicated with said first purge mechanism or said second purge mechanism based on a detection result of the operation condition detecting mechanism.
2. (Previously presented) An optical apparatus as claimed in claim 1, further comprising a light source which emits illumination light.
3. (Previously presented) An optical apparatus as claimed in claim 2, wherein said light source includes an excimer laser light source which emits excimer laser light.
4. (Previously Presented) An optical apparatus as claimed in claim 1, further comprising an illumination optical system having a plurality of optical

elements and illuminating a mask with illumination light, wherein at least some of said plurality of optical elements of the illumination optical system are accommodated in said barrel.

5. (Previously presented) An optical apparatus as claimed in claim 4, further comprising a projection optical system that projects at least part of a pattern formed on said mask onto a substrate.

6. (Previously presented) An optical apparatus as claimed in claim 1, wherein said first gas is inert gas, and said second gas is oxygen, which has at least the same concentration as that in the atmosphere, or mixed gas, which contains oxygen.

7. (Previously presented) An optical apparatus as claimed in claim 6, further comprising a cleaning apparatus arranged in a flow path of the first gas and the second gas to remove impurities from the gases.

8. (Currently amended) An optical apparatus as claimed in claim 1, wherein said operation condition detecting mechanism includes an environment monitor, and said control apparatus switches the purge mechanism ~~connected to~~ communicated with said barrel from the first purge mechanism to the second purge mechanism based on the detection results of the environment monitor when the concentration of said predetermined gas falls below a predetermined value.

9. (Currently amended) An optical apparatus as claimed in claim 1, further comprising an exhaust apparatus connected to said chamber; and an exhaust monitor provided with said exhaust apparatus to detect the exhaust volume of said exhaust apparatus, wherein said control apparatus switches the purge mechanism ~~connected to~~ communicated with said barrel from the first purge

mechanism to the second purge mechanism based on the detection results of the exhaust monitor when said exhaust volume falls below a predetermined value.

10. (Cancelled)

11. (Cancelled)

12. (Previously Presented) An optical apparatus as claimed in claim 1, wherein said second purge mechanism is connected to the barrel when part of the chamber is in an opened state, when a power supply of said optical apparatus is off, or when said optical apparatus is being transported, assembled, or adjusted.

13. (Previously presented) An optical apparatus as claimed in claim 1 further comprising a holder that stores and holds said second gas.

14. (Currently amended) An exposure apparatus that transfers a pattern of a mask to a substrate, the exposure apparatus comprising:

a light source which emits illumination light;

a barrel accommodating at least one of a plurality of optical elements disposed between said light source and said substrate;

a chamber which accommodates said barrel;

a first purge mechanism provided with said barrel to supply a first gas into said barrel;

a second purge mechanism provided with said barrel to supply a second gas having a composition differing from said first gas into said chamber;

an operation condition detecting mechanism disposed in said chamber to detect the concentration of a predetermined gas inside said chamber; and

a control apparatus connected to said first purge mechanism, said second purge mechanism and said operation condition detecting mechanism ~~to selectively connect such that~~ said barrel ~~to~~ is selectively communicated with said first purge

mechanism or said second purge mechanism based on a detection result of the operation condition detecting mechanism.

15. (Previously Presented) An exposure apparatus as claimed in claim 14, wherein said barrel is one of a first barrel which accommodates the optical elements in said light source, a second barrel which accommodates at least one of the optical elements disposed between said light source and said mask, and a third barrel which accommodates at least one of the optical elements disposed between said mask and said substrate.

16. (Previously Presented) An exposure apparatus as claimed in claim 14, further comprising a recovering apparatus that recovers said first gas through at least one of the chamber accommodating said barrel and said barrel.

17. (Previously presented) An exposure apparatus as claimed in claim 15, wherein said second gas is chemically clean dry air.

18. (Cancelled)

19. (Cancelled)

20. (Previously Presented) An exposure apparatus as claimed in claim 15, further comprising a plurality of sensors provided in each of said plurality of barrels, wherein said light emission control apparatus controls said light source based on outputs of said plurality of sensors.

21. (Previously Presented) An exposure apparatus as claimed in claim 14, further comprising an illumination optical system illuminating said mask with said illumination light, a projection optical system projecting at least part of said mask pattern, which is illuminated with said illumination light, onto said substrate, and a transmission system disposed between said light source and said illumination

optical system, wherein said barrel is configured as part of said illumination optical system, said projection optical system, or said transmission system.

22. (Cancelled)

23. (Cancelled)

24. (Previously Presented) An exposure apparatus as claimed in claim 14, further comprising an exhaust apparatus connected to said chamber and operated when said second gas is supplied.

25. (Previously Presented) An exposure apparatus as claimed in claim 24, wherein said exhaust apparatus is controlled based on an output of said operation condition detecting mechanism.

26. (Cancelled)

27. (Withdrawn) A laser light source used in an exposure apparatus that transfers a pattern of a mask onto a substrate, the laser light source comprising:

a tank which stores a second gas, which has a composition differing from a first gas that is supplied during the operation of said exposure apparatus; and

piping connected to the laser light source to introduce said second gas into the laser light source when the laser light source is separated from said exposure apparatus.

28. (Withdrawn) A gas supply method for supplying a predetermined gas to an airtight chamber, which accommodates optical elements and is disposed in an optical apparatus, the gas supply method comprising the steps of:

detecting an operation condition of said optical apparatus;

selectively supplying the airtight chamber with a first gas or a second gas, the composition of which differs from the first gas, as said predetermined gas based on the detection result.

29. (Withdrawn) A gas supply method as claimed in claim 28, wherein said first gas is inert gas, and said second gas is oxygen, which has at least the same concentration as that in the atmosphere, or mixed gas, which contains oxygen.

30. (Withdrawn) A gas supply method as claimed in claim 29, wherein said optical apparatus includes a housing accommodating said airtight chamber, the gas concentration in the inside or outside of said housing is detected, and, based on the results of the detection, said first gas is supplied to said airtight chamber when said gas concentration exceeds a predetermined value, and said second gas is supplied to the airtight chamber when said gas concentration falls below said predetermined value.

31. (Withdrawn) A gas supply method as claimed in claim 29, wherein said optical apparatus includes an exhaust apparatus connected to said airtight chamber, the gas supply method comprising the steps of:

detecting an exhaust volume of said exhaust apparatus; and

supplying said first gas to said airtight chamber when said exhaust volume is greater than or equal to a predetermined value, and supplying said second gas to said airtight chamber when the gas concentration falls below said predetermined value.

32. (Withdrawn) A gas supply method as claimed in claim 29, wherein said first gas is supplied to said airtight chamber when said optical apparatus is operated.

33. (Withdrawn) A gas supply method as claimed in claim 32, wherein said second gas is supplied to said airtight chamber when said airtight chamber or part of a housing accommodating the airtight chamber is opened or when a power supply of the optical apparatus is off.

34. (Withdrawn) A gas supply method as claimed in claim 29, wherein said optical apparatus includes an illumination optical system which illuminates a mask with illumination light from a light source, a projection optical system which projects at least part of a pattern of the mask illuminated with said illumination light onto a photosensitive substrate, and a transmission system disposed between said light source and said illumination optical system, wherein said airtight chamber is provided in at least one of said illumination optical system, said projection optical system, and said transmission system.

35. (Withdrawn) An exposure method comprising the step of:
projecting a pattern of a mask onto a substrate using a gas supply method for supplying a predetermined gas to an airtight chamber, which accommodates optical elements and is disposed in an optical apparatus, the gas supply method including the steps of:

detecting an operation condition of said optical apparatus; and
selectively supplying the airtight chamber with a first gas or a second gas, the composition of which differs from the first gas, as said predetermined gas based on the detection result.

36. (Withdrawn) An exposure method for projecting a pattern formed on a mask onto a substrate, the exposure method comprising the step of:
supplying a first gas to said airtight chamber using the gas supply method for supplying a predetermined gas to an airtight chamber, which accommodates optical elements and is disposed in an optical apparatus before projecting said pattern onto said substrate, the gas supply method including the steps of:

detecting an operation condition of said optical apparatus; and

selectively supplying the airtight chamber with a first gas or a second gas, the composition of which differs from the first gas, as said predetermined gas based on the detection result, wherein said first gas is inert gas, and said second gas is oxygen, which has at least the same concentration as that in the atmosphere, or mixed gas, which contains oxygen, and wherein said first gas is supplied to said airtight chamber when said optical apparatus is operated.

37. (Withdrawn) A device manufacturing method comprising the steps of: supplying a first gas to said airtight chamber using the gas supply method; and projecting a pattern formed on a mask onto a substrate, the gas supply method including the steps of:

detecting an operation condition of said optical apparatus; and

selectively supplying the airtight chamber with a first gas or a second gas, the composition of which differs from the first gas, as said predetermined gas based on the detection result, wherein said first gas is inert gas, and said second gas is oxygen, which has at least the same concentration as that in the atmosphere, or mixed gas, which contains oxygen, and wherein said first gas is supplied to said airtight chamber when said optical apparatus is operated.

38. (Currently Amended) An optical apparatus including at least one barrel for accommodating optical elements, the optical apparatus comprising:

a chamber which accommodates said barrel;

a first purge mechanism provided with said barrel to supply a first gas into said barrel;

a second purge mechanism provided with said barrel to supply a second gas having a composition differing from the first gas into said barrel;

an exhaust apparatus connected to said chamber;

an exhaust monitor provided with said exhaust apparatus to detect the exhaust volume of said exhaust apparatus; and

a control apparatus connected to said first purge mechanism, said second purge mechanism and said exhaust monitor ~~to selectively connect~~ such that said

barrel ~~to~~ is communicated with said first purge mechanism or said second purge mechanism based on a detection result of said exhaust monitor.

39. (Currently Amended) An optical apparatus as claimed in claim 38, further comprising an operation condition detecting mechanism disposed in said chamber to detect the concentration of a predetermined gas inside said chamber, wherein said control apparatus ~~selectively connects~~ is configured such that said barrel ~~to~~ is communicated with said first purge mechanism or said second purge mechanism based on a detection result of the operation condition detecting mechanism.

40. (Previously Presented) An optical apparatus as claimed in claim 38, said control apparatus switches the purge mechanism connected to said barrel from the first purge mechanism to the second purge mechanism based on the detection results of the exhaust monitor when said exhaust volume falls below a predetermined value.

41. (Previously Presented) An optical apparatus as claimed in claim 40, wherein said first gas is inert gas, and said second gas is oxygen, which has at least the same concentration as that in the atmosphere, or mixed gas, which contains oxygen.

42. (Previously Presented) An optical apparatus as claimed in claim 38, wherein said optical elements is configured as part of a laser light source that emits laser light and wherein said chamber accommodates the laser light source.

43. (Currently Amended) An exposure apparatus including a main body that transfers a pattern of a mask to a substrate, the exposure apparatus comprising:
a chamber which accommodates said main body;
a first purge mechanism provided with said main body to supply a first gas into said main body;

a second purge mechanism provided with said main body to supply a second gas having a composition differing from the first gas into said main body;

an exhaust apparatus connected to said chamber;

an exhaust monitor provided with said exhaust apparatus to detect the exhaust volume of said exhaust apparatus; and

a control apparatus connected to said first purge mechanism, said second purge mechanism and said exhaust monitor ~~to selectively connect such that~~ said main body ~~to~~ is communicated with said first purge mechanism or said second purge mechanism based on a detection result of said exhaust monitor.

44. (Previously Presented) An optical apparatus as claimed in claim 43, further comprising:

a laser source having a laser excitation portion; and

a laser chamber accommodates said laser source, wherein said exhaust apparatus is connected to said laser chamber.

45. (Currently Amended) An optical apparatus as claimed in claim 43, further comprising an operation condition detecting mechanism disposed in said chamber to detect the concentration of a predetermined gas inside said chamber, wherein said control apparatus ~~selectively connects~~ is configured such that said main body ~~to~~ is communicated with said first purge mechanism or said second purge mechanism based on a detection result of the operation condition detecting mechanism.

46. (Previously Presented) An optical apparatus as claimed in claim 45, said control apparatus switches the purge mechanism connected to said main body from the first purge mechanism to the second purge mechanism based on the detection results of the exhaust monitor when said exhaust volume falls below a predetermined value.

Appln. No. 09/856,384
Inventors: K. Motegi et al.
RCE and Reply to Office Action dated April 8, 2004

47. (Previously Presented) An optical apparatus as claimed in claim 43, wherein said first gas is inert gas, and said second gas is oxygen, which has at least the same concentration as that in the atmosphere, or mixed gas, which contains oxygen.